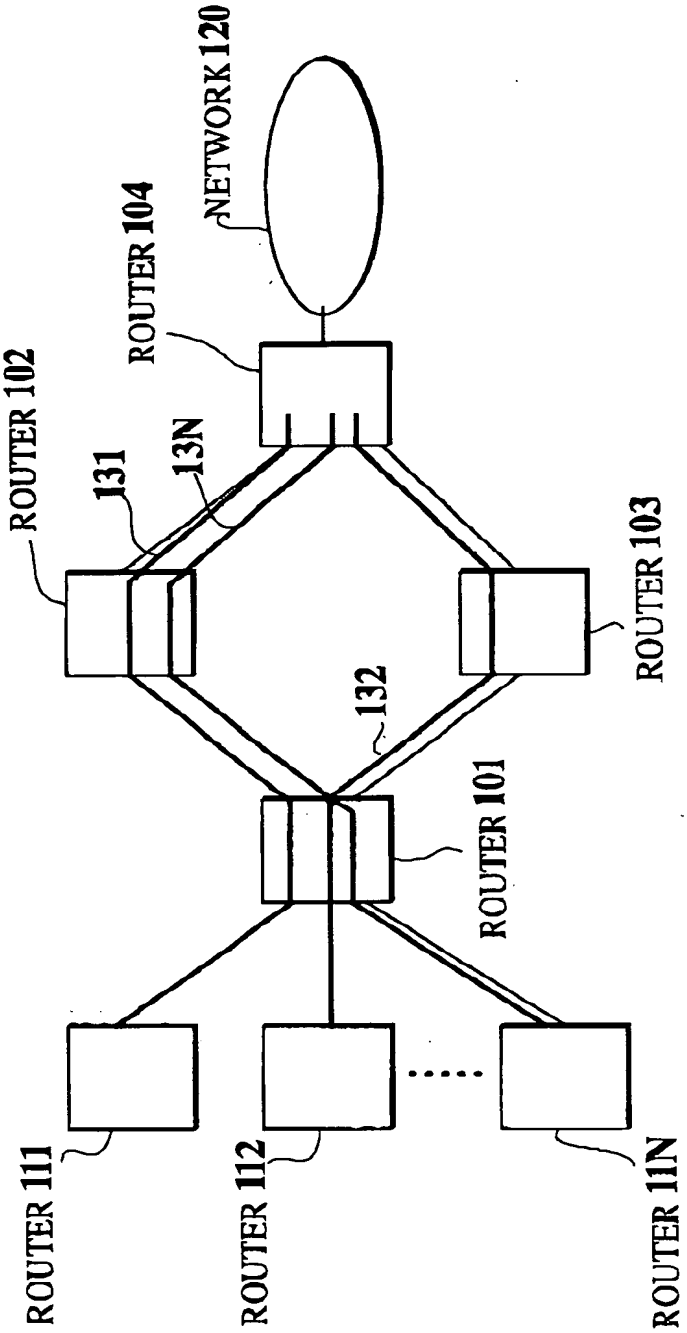
FIG.1


NETWORK 120
ROUTER 104
ROUTER 102
131
13N
ROUTER 103
132
ROUTER 101
ROUTER 111
ROUTER 112
ROUTER 11N

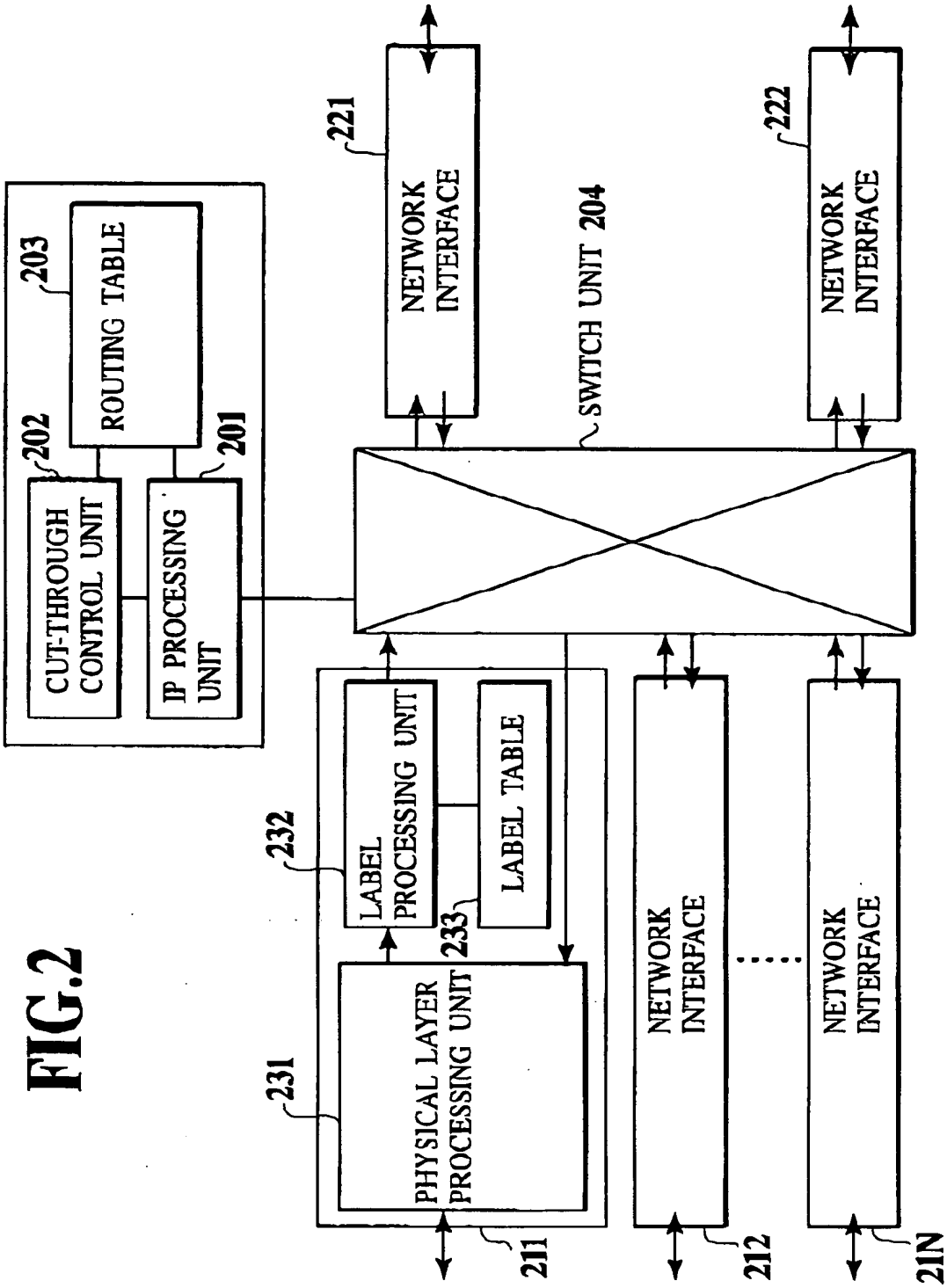


FIG.2

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FIG.3

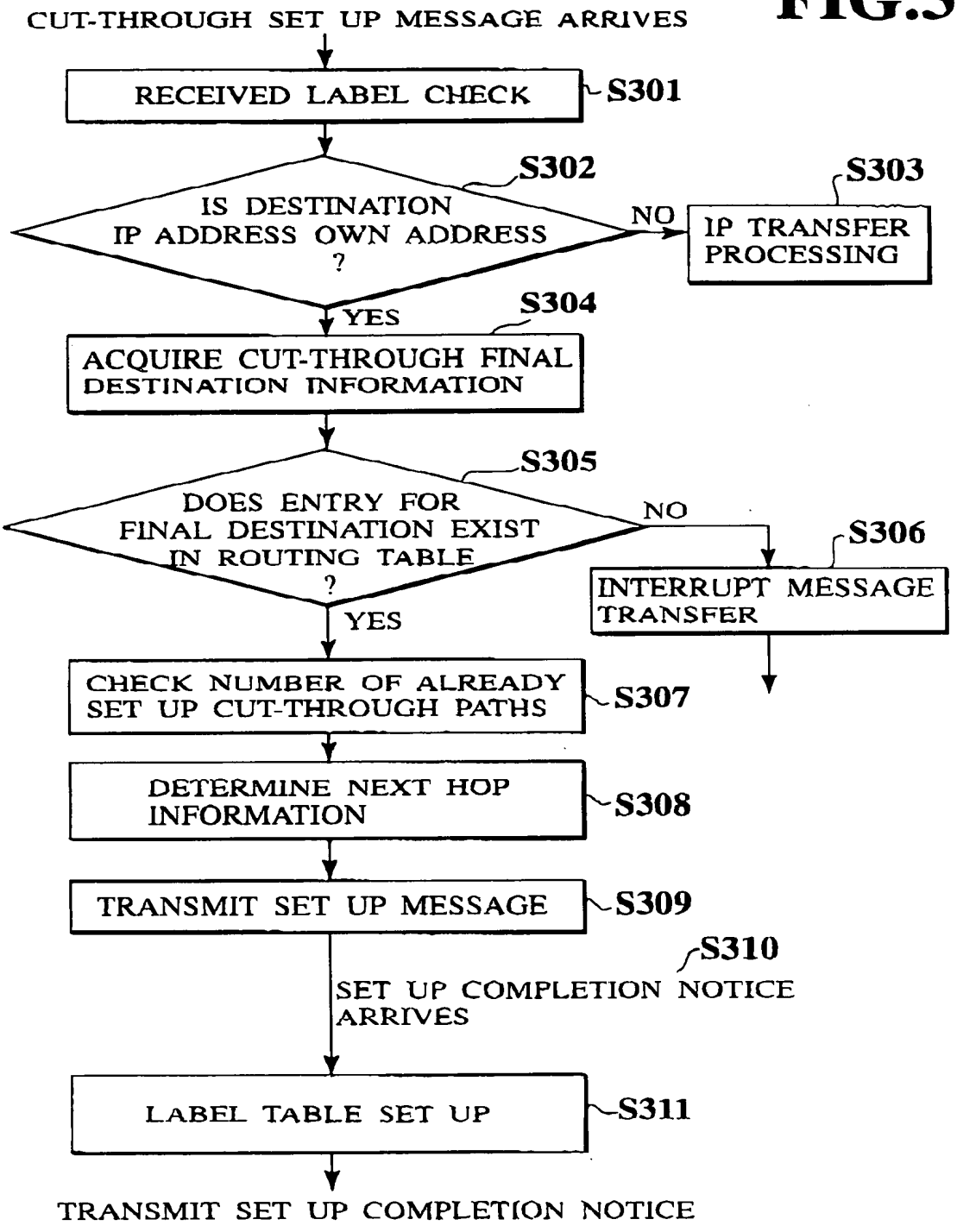
CUT-THROUGH SET UP MESSAGE ARRIVES
RECEIVED LABEL CHECK
S301
S302
IS DESTINATION IP ADDRESS OWN ADDRESS ?
NO
S303
IP TRANSFER PROCESSING
YES
S304
ACQUIRE CUT-THROUGH FINAL DESTINATION INFORMATION
S305
DOES ENTRY FOR FINAL DESTINATION EXIST IN ROUTING TABLE ?
NO
S306
INTERRUPT MESSAGE TRANSFER
YES
CHECK NUMBER OF ALREADY SET UP CUT-THROUGH PATHS
S307
DETERMINE NEXT HOP INFORMATION
S308
TRANSMIT SET UP MESSAGE
S309
S310
SET UP COMPLETION NOTICE ARRIVES
LABEL TABLE SET UP
S311
TRANSMIT SET UP COMPLETION NOTICE

FIG.4

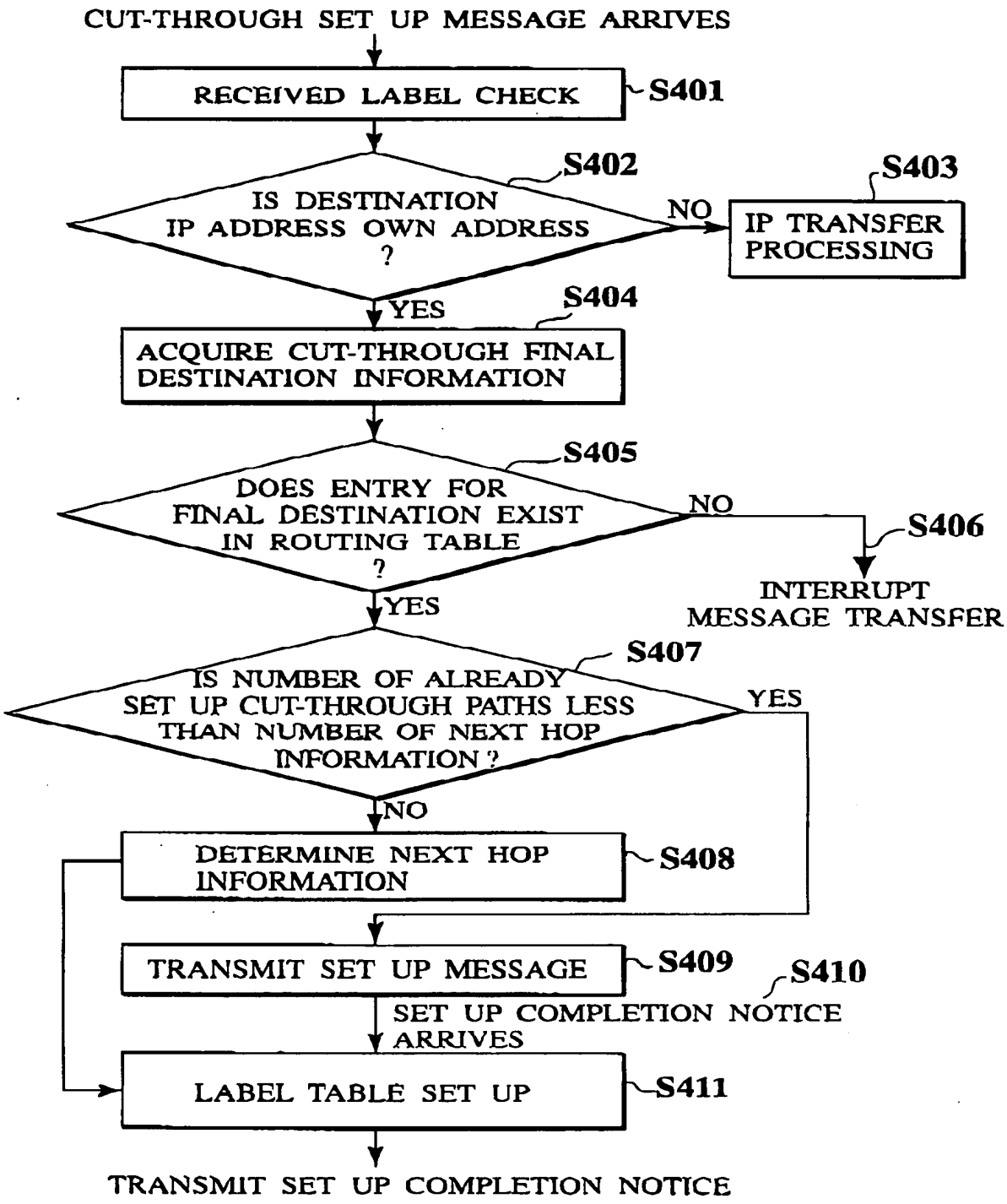
CUT-THROUGH SET UP MESSAGE ARRIVES
RECEIVED LABEL CHECK
S401
S402
IS DESTINATION IP ADDRESS OWN ADDRESS ?
NO
S403
IP TRANSFER PROCESSING
YES
S404
ACQUIRE CUT-THROUGH FINAL DESTINATION INFORMATION
S405
DOES ENTRY FOR FINAL DESTINATION EXIST IN ROUTING TABLE ?
NO
S406
INTERRUPT MESSAGE TRANSFER
YES
S407
IS NUMBER OF ALREADY SET UP CUT-THROUGH PATHS LESS THAN NUMBER OF NEXT HOP INFORMATION ?
YES
NO
DETERMINE NEXT HOP INFORMATION
S408
TRANSMIT SET UP MESSAGE
S409
S410
SET UP COMPLETION NOTICE ARRIVES
LABEL TABLE SET UP
S411
TRANSMIT SET UP COMPLETION NOTICE

FIG.5

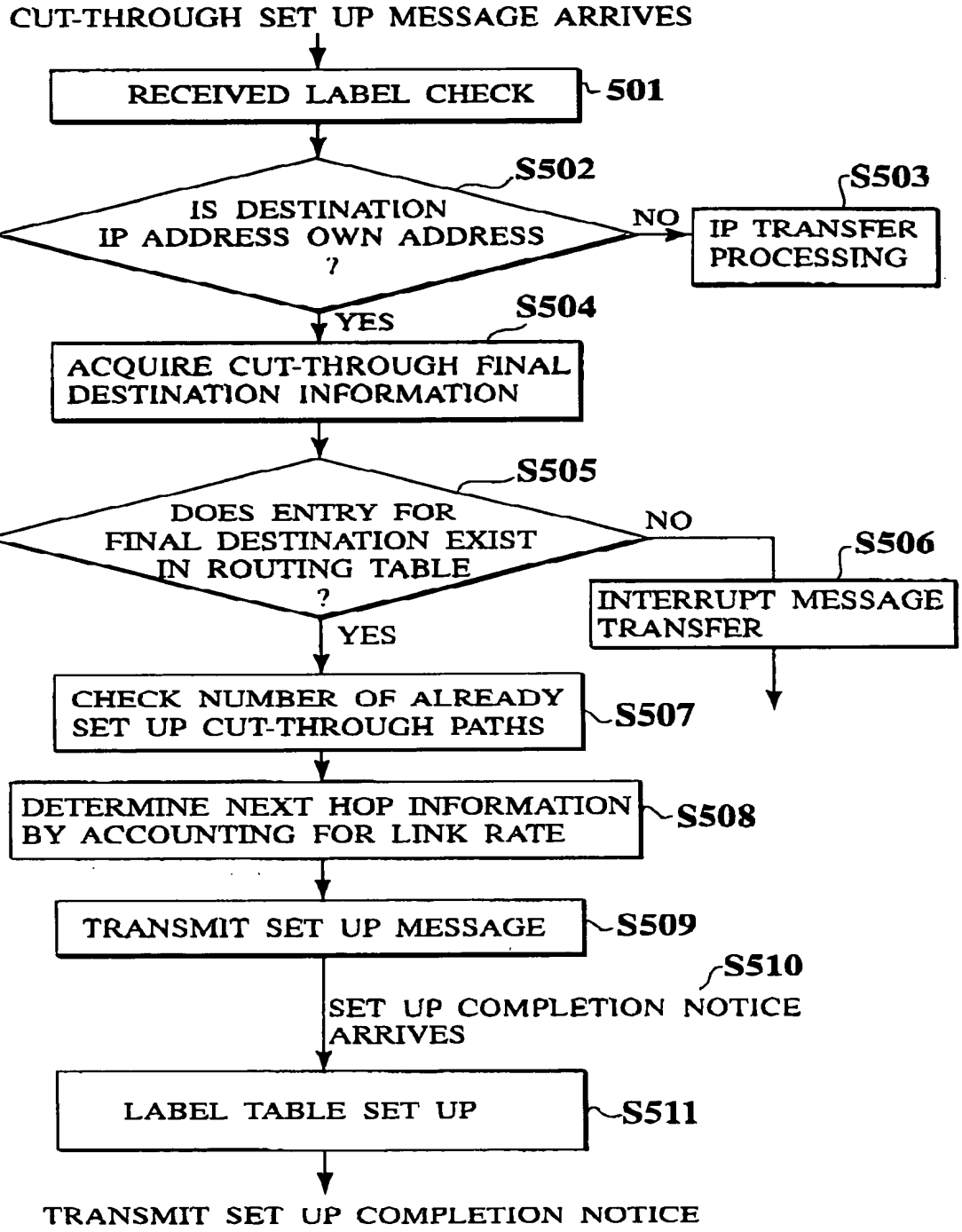
CUT-THROUGH SET UP MESSAGE ARRIVES
RECEIVED LABEL CHECK
501
S502
IS DESTINATION IP ADDRESS OWN ADDRESS ?
NO
S503
IP TRANSFER PROCESSING
YES
S504
ACQUIRE CUT-THROUGH FINAL DESTINATION INFORMATION
S505
DOES ENTRY FOR FINAL DESTINATION EXIST IN ROUTING TABLE ?
NO
S506
INTERRUPT MESSAGE TRANSFER
YES
CHECK NUMBER OF ALREADY SET UP CUT-THROUGH PATHS
S507
DETERMINE NEXT HOP INFORMATION BY ACCOUNTING FOR LINK RATE
S508
TRANSMIT SET UP MESSAGE
S509
S510
SET UP COMPLETION NOTICE ARRIVES
LABEL TABLE SET UP
S511
TRANSMIT SET UP COMPLETION NOTICE

FIG.6

601 DESTINATION ADDRESS	602 NUMBER NEXT HOP INFORMATION	611 NEXT HOP INFORMATION ..... 61N NEXT HOP INFORMATION	603 NUMBER OF CUT-THROUGH PATHS
.....	.....	.....	

FIG.7

701 RECEIVED LABEL	702 OUTPUT INTERFACE	703 OUTPUT LABEL VALUE
.....	.....	.....

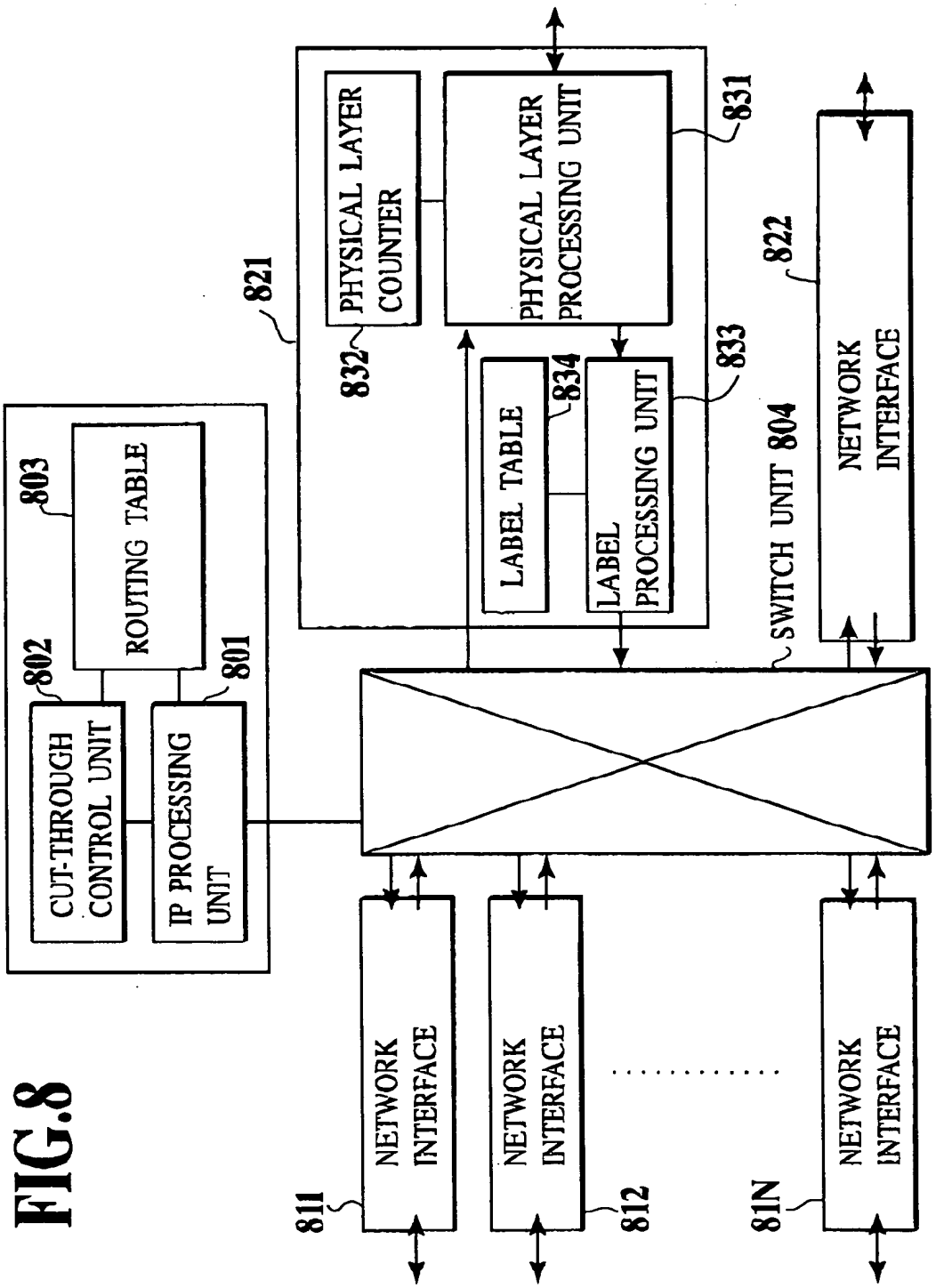
821
PHYSICAL LAYER COUNTER
832
PHYSICAL LAYER PROCESSING UNIT
831
LABEL TABLE
834
LABEL PROCESSING UNIT
833
SWITCH UNIT 804
822
NETWORK INTERFACE
803
ROUTING TABLE
802
CUT-THROUGH CONTROL UNIT
801
IP PROCESSING UNIT
811
NETWORK INTERFACE
812
NETWORK INTERFACE
81N
NETWORK INTERFACE

FIG.8

FIG.9

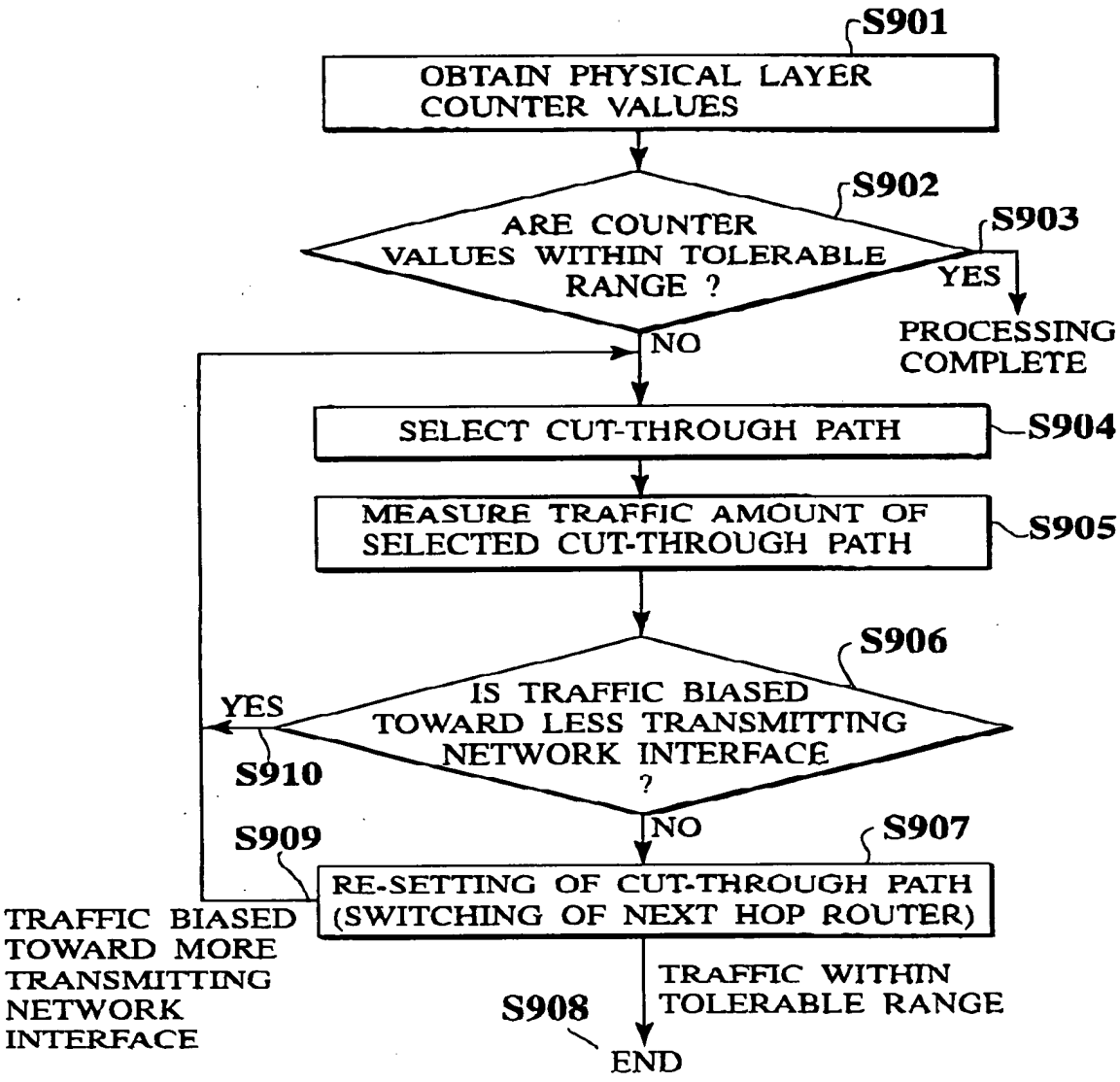
S901
OBTAIN PHYSICAL LAYER COUNTER VALUES
S902
ARE COUNTER VALUES WITHIN TOLERABLE RANGE ?
S903
YES
PROCESSING COMPLETE
NO
SELECT CUT-THROUGH PATH
S904
MEASURE TRAFFIC AMOUNT OF SELECTED CUT-THROUGH PATH
S905
S906
IS TRAFFIC BIASED TOWARD LESS TRANSMITTING NETWORK INTERFACE ?
YES
S910
NO
S907
S909
RE-SETTING OF CUT-THROUGH PATH (SWITCHING OF NEXT HOP ROUTER)
TRAFFIC BIASED TOWARD MORE TRANSMITTING NETWORK INTERFACE
TRAFFIC WITHIN TOLERABLE RANGE
S908
END

FIG.10

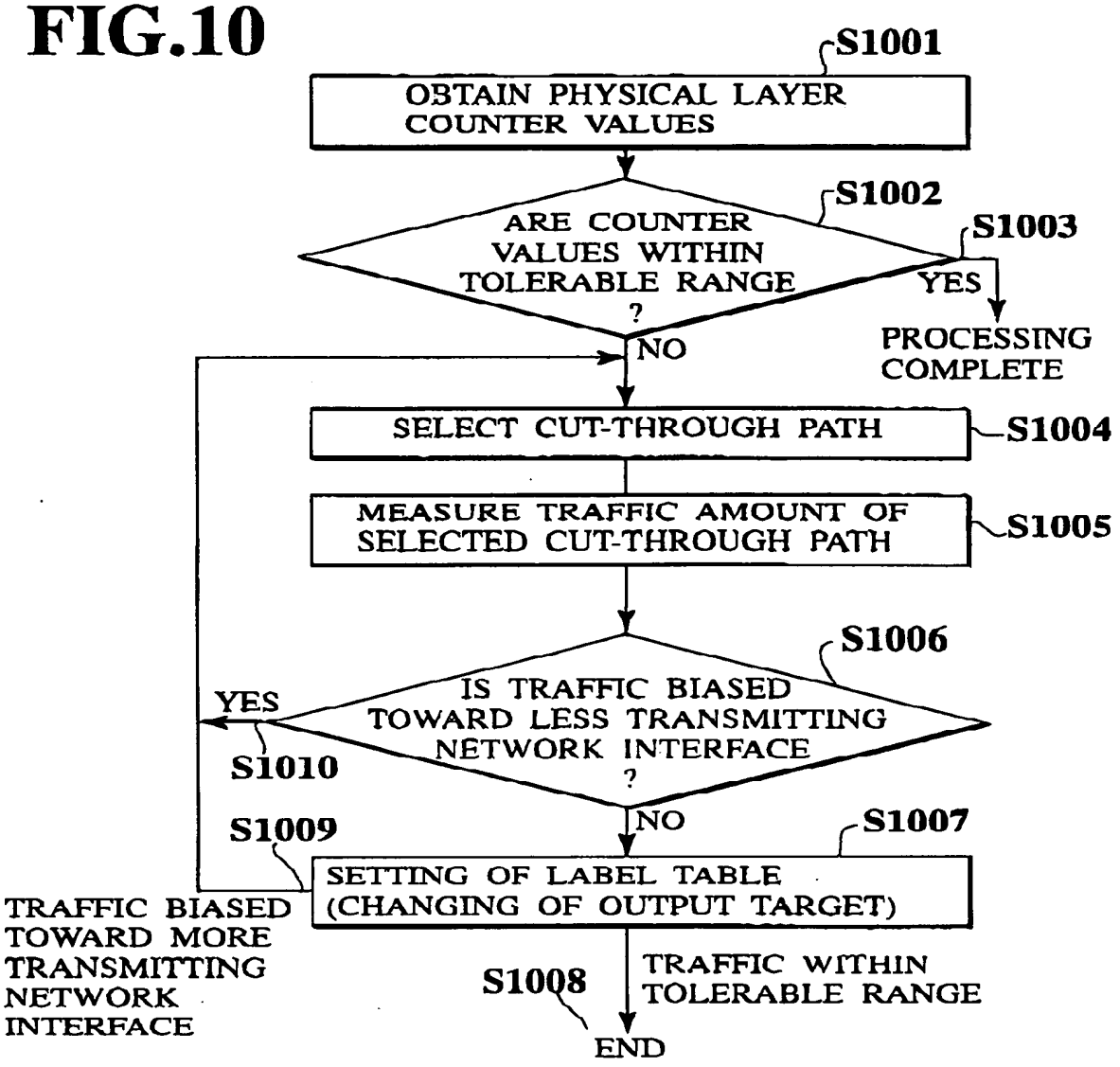

FIG.11

1101 RECEIVED LABEL	1102 OUTPUT INTERFACE	1103 OUTPUT LABEL VALUE	1104 NUMBER OF RECEIVED FRAMES
⋮	⋮	⋮	